

# PROGRAM ASSESSMENT

## FAPESP IMPACTS SERIES

### RESEARCH PROGRAM IN PARTNERSHIP FOR TECHNOLOGICAL INNOVATION (PITE)

#### MAIN RESULTS

##### Program's General Information

- Assessment period: 1995 – 2006.
- Completed in 04/2008.
- A total of 54 projects from 64 companies were assessed, which corresponded a total investment of BRL 43.8 million.

This document is part of a set of summaries presenting the results of impact assessments performed for the FAPESP programs. The full document and assessment can be seen at <http://www.fapesp.br/avaliacao/relatorios/pite.pdf>

PITE was created in 1995 and it is one of FAPESP's programs in the Technological Innovation line. The purpose of the program is to co-finance research projects in academic institutions or research institutions (RI) that are formulated in cooperation with companies<sup>1</sup>. The program is based on the research commitment and long-term innovation - with shared costs - between a company and Research Institutions.

In order to analyze the impacts, an assessment of the additionality with verification of causality was performed applied to the following topics<sup>2</sup>:

- University - Company Relationship
- Innovation/Innovation culture
- Resources and Infrastructure
- Training and competences
- Technical-scientific production
- Social-economic performance

Questionnaires encompassing all modalities of the program were prepared and sent to all 69 projects completed until 2006. A response was obtained for 65 of the projects, whereas:

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1 Updated information on PITE can be obtained at <http://www.fapesp.br/61>.

2 Regarding the causality redundant verification applied to PIPE, please refer to Salles-Filho et al. *Research Evaluation*, 20(2), June 2011, pages 159–171.

- 34 projects answered by both parties (companies and research institutions);
- 26 projects answered only by the research institutions; and
- 5 projects only answered by the companies

At the time of the assessment, PITE was developed from 3 modalities.

1. Development of innovation projects in exploratory phase.
2. Development of innovation with low technological and trade risk.
3. Development of innovation with high technological risk, with impact aggravations and significant social-economic contribution.

Chart 1 presents some of the characteristics of companies and institutions participating in the sample.

**Chart 1 – General characteristics of companies and institutions in projects assessed in PITE**

1. Most of the companies were large (over 500 employees) and has been in the market for more than 20 years, with their own research capabilities, since they have R&D departments.
2. 21% of the projects were idealized by companies considered small.
3. Most companies and research institutions had no previous projects;
4. 79% of the research institutes and 69% of the companies had new partnerships as a consequence of PITE.

The main sectors represented by the companies using 2-digit CNAE classification were:

- Chemical Equipment
- Transportation Equipment
- Basic Metallurgy
- Refining Petroleum, Fuel and Alcohol
- Cellulose and Paper

In total, companies from approximately 16 CNAE divisions were involved.

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## **Contributions of the PITE Program for R&D and innovation in the companies**

From the 65 projects in the sample, 57 presented results within or above the expectations, and 26 projects had already generated some kind of innovation, which is equivalent to 40% of the total projects. In total, 146 results were reported, with 45 being related to the advancement of scientific knowledge, 31 resulting in new processes, 29 in new products, 20 in new software and 1 in new service.

Between 38 to 48 rights of intellectual property were requested and/or obtained (variation according to the point of view, if by the company or the RI), with at least 17 and a maximum of 23 patents, with strong concentration in few projects. The registration of software was also emphasized.

On both sides, most of the projects do not expected to generate income from the DPIs by means of licensing, thus revealing that an expressive part of the technological developments and innovations are and will be exploited by the participating companies themselves. The sampled projects generated 6 spin-offs. Three of these spin-offs are in the software area, two in the non-metallic scrap recycling area and one in the fish farming area.

From the total results, 37% became innovation, 30% have not become innovation yet, but are expected to become, and 23% do not have such expectation.

Most of the innovations presented a level of novelty at the national level (60%), 20% were considered new regarding the company level, and 20% are novelties in a global level, revealing a relatively high originality profile for the national standards.

Investments in R&D and innovation in the sample companies ranged between 1% and 5%. Regarding the leveraging of resources, FAPESP allocated BRL 43.8 million to the companies and BRL 53.2 million to the institutions.

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### Economic impacts and knowledge production associated to the PITE Program

Some projects reported productivity gains and cost reduction as a result of PITE. These are companies that innovated from the results of the projects. Except for two cases (E6, E11), the attributions of causality to PITE were very high, with 4 cases above 40%.

**Table 1 – PITE productivity, cost and impacts per company.**

Company	Productivity gains	Cost reduction	Attribution of impacts to the PITE project
E12A	36 to 40%	6 to 10%	n.a.
E12B	1 to 5%	1 to 5%	16 to 20%
E6	1 to 5%	16 to 20%	11 to 15%
E8	6 to 10%	1 to 5%	81 to 85%
E11	1 to 5%	1 to 5%	1 to 5%
E15	41 to 45%	21 to 25%	66 to 70%
E13	6 to 10%	1 to 5%	86 to 90%
E19A	1 to 5%	0%	46 to 50%

Regarding the variation of R&D personnel at the companies, there was a relatively low impact: considering the number of researchers before and one year after the conclusion of the PITE project, only 4 new higher education job positions were identified exclusively for R&D activities. The greatest expansion was for basic and secondary education outsourced personnel for the support to research and innovation activities.

Regarding the training impacts, in the case of research institutions, there was mostly the training of competencies regarding the project management area, identification of demands in the companies and the negotiation with private actors.

On the other hand, the companies expanded their relationship and negotiation capacity with the public research organizations.

The PITE projects had relatively important academic productions as results, as well as the technology developments and innovations. Approximately 3 papers per project, most of them presented in National and international Conferences, were the average production in the assessed sample.

There were a considerable number of undergraduate and graduate supervisions, with an average 5.43 per project. Regarding this subject, the program mainly focuses on undergraduate students by means of undergraduate supervisions (118) followed by master degree dissertations (95) and PhD theses (66). Both for publications and supervisions, there is a strong concentration in few projects, with more than half of the projects with no academic production.

From the projects participating in the sample, 9 declared they had productivity gains and cost reduction with the PITE Program. Similarly, it could be noticed that the Program allowed for new equipment to be purchased for 29% of the research institutions and 34% of the companies, as well as improvements implemented in R&D management in the research institutions (10%).

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## Conclusion

The PITE program reached one of its purposes of promoting interaction between research institutions and companies for R&D. The expressive number of technological results and the fact of almost half of the projects having reached innovations implemented by the participating companies must be emphasized. The expected increase in qualified human resources for P&D in the companies happened in a limited way, being a point to be challenged by the Program. These results added to the concentration of academic results in a reduced number of projects show there is potential to improve the program's impact.